

In the Claims:

Please cancel claims 30-39 and amend claims 1-4, 7, 9-11, 14-16, 18, 21, 22, 24, 26 and 29 as follows:

sub 1 >
1. (Amended) A method for producing a boride layer on a surface by plasma boronizing comprising:
supplying a gas mixture containing a boron-releasing gas to a treatment chamber of a reactor;
generating a glow discharge in the reactor;
determining an amount of at least one excited boron-releasing gas product in the glow discharge; and
selecting production parameters of the plasma generated in the treatment chamber of the reactor so as to maintain at least one of: at least one of a minimum value and a maximum value of the determined excited boron-releasing gas product, and at least one of a minimum value or a maximum value of a relation of one or more of the determined excited boron-releasing gas products to another glow discharge product to produce a boride layer.

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2. (Amended) A method according to claim 1, wherein said step of generating the glow discharge in the reactor comprises using a pulsed DC voltage source having a ratio of voltage pulse duration to subsequent pulse pause duration which is greater than 1.1:1.

3. (Amended) A method according to claim 1 wherein said step of generating the glow discharge in the reactor comprises applying a DC voltage in pulses having a pulse period of less than 230 μ s.

508 B₂

4. (Amended) The method according to claim 1, further comprising [for producing a boride layer on a surface by plasma boronizing comprising]:

generating a glow discharge in the reactor while maintaining the gas mixture at a selected treatment temperature during a first stage to first produce said boride layer and prevent formation of halogenides which cause formation of pores, and maintaining the gas mixture at a higher temperature than a previous temperature during in a second stage.

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7. (Amended) A method according to claim 1 wherein the method includes a first stage during which the gas mixture is maintained at a selected temperature to prevent formation of halogenides which cause formation of pores to first produce said boride layer, followed by a second stage during which the gas mixture is maintained at a higher temperature.

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9. (Amended) A method according to claim 2 wherein the method includes a first stage during which the gas mixture is maintained at a selected temperature to prevent formation of halogenides which cause formation of pores to first produce said boride layer, followed by a second stage during which the gas mixture is maintained at a higher temperature.

10. (Amended) A method according to claim 3 wherein the method includes a first stage during which the gas mixture is maintained at a selected temperature to prevent formation of halogenides which cause formation of pores to first produce said boride layer followed by a second stage during which the gas mixture is maintained at a higher temperature.

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concl'd

11. (Amended) A method according to claim 1 including determining the amount of the excited boron-releasing gas in the reactor at least in a relative manner.

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14. (Amended) A method according to claim 13 wherein, in order to form one of the minimum value and the maximum value of the excited boron-releasing gas content, the determined amount of the excited boron-releasing gas is set in relation to a determined amount of at least one further boron-releasing gas product.

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15. (Amended) A method according to claim 1 wherein said supplied gas mixture comprises boron trihalide as the boron-releasing gas product in a concentration greater than about 1% by volume, along with hydrogen gas and, optionally, a noble gas.

16. (Amended) A method according to claim 4 wherein the glow discharge is generated by applying a pulsed DC voltage which has a ratio of the voltage pulse duration to the subsequent pulse pause duration in the range from about 1.1:1 to 5:1 ratio.

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18. (Amended) A method according to claim 4 further comprising generating the glow discharge using a pulsed DC voltage having a pulse period of less than about 210 μ s.

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21. (Amended) A method according to claim 20 wherein the pulsed DC voltage is in the range between about 650 volts and about 800 volts.

22. (Amended) A method according to claim 1 wherein the reactor pressure is maintained in a pressure range between about 0.5 and about 15 hPa.

a7 24. (Amended) A method according to claim 1 wherein the gas mixture contains a boron trihalide in a concentration of between 2% by volume and about 50% by volume.

a8 26. (Amended) A method according to claim 1 wherein the gas mixture contains up to 20% by volume of a noble gas and 2% by volume to 50% by volume of boron trihalide, the remainder being hydrogen gas.

a9 29. (Amended) A method according to claim 1 wherein the boron-releasing gas is one of BCl_3 , BF_3 and mixtures thereof.

REMARKS

I. INTRODUCTION

Claims 30-39 have been cancelled, without prejudice. Claims 1-4, 7, 9-11, 14-16, 18, 21-22, 24, 26 and 29 have been amended. No new matter has been added. Claims 1-29 remain pending in the present application. Attached hereto is a marked-up version of the changes made to the claims by the current amendment to comply with 37 C.F.R.

1.121. The attached page is captioned "Version with markings to show changes made." Reconsideration of the present application based on the foregoing amendments and the following remarks is respectfully requested.

II. REJECTION UNDER 35 U.S.C. § 112 SHOULD BE WITHDRAWN

Claims 1-29 and 37-38 stand rejected under 35 U.S.C. § 112, second paragraph, as being allegedly indefinite for failing to particularly point out and distinctly claim the